

Remarks

Claims 1, 14, 21, 30 and 31 have been amended, and new claims 32-38 have been added. Review and reconsideration in light of the amendments and the remarks below are respectfully requested.

Claims 30 and 31 have been amended to address the objections to those claims raised in the Office action.

Claims 1-31 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,523,914 to Poggenburg et al. Claims 1-31 are also rejected as being anticipated under 35 U.S.C. §102(b) by U.S. Pat. Nos. 3,918,766 to Klatt; 4,844,557 to Giers; 6,012,010 to Batistic et al.; 6,023,343 to Ogino; 6,089,680 to Yoshioka et al.; 5,774,821 to Eckert; 6,027,131 to Katayose et al; and Japanese Patent 6-64515.

Accordingly, claim 1 has been amended to specify that the control system is for controlling a brake system of a braked vehicle during a turn, and that the control system is configured to receive a driver input relating to a brake pressure sought to be applied. Claim 1 has also been amended to specify that the controller is configured to direct the brake system to modify the brake pressure applied to each of the wheels such that the brake pressure applied to a given wheel is always equal to or less than said brake pressure sought to be applied. Independent claims 21, 30 and 31 have been amended in a manner similar to or analogous to claim 1.

Thus, the independent claims have been amended to more clearly emphasize that the present invention modifies the brake pressure requested by the driver. For example, the brake pressure at any given wheel may be decreased and then subsequently held, increased or decreased, but all of these changes in brake pressure do not increase the brake pressure at any given wheel above the brake pressure requested by the driver. In this manner the control system works within the pressure "confines" provided by the driver requested brake pressure.

This feature of the invention is disclosed at, for example, page 9, lines 13-23 of the originally-filed application. In addition, originally-filed claim 14 specified that the controller is configured to direct the brake system to increase brake pressure to a wheel only when the pressure in the brake of interest is less than the pressure in a master cylinder of the brake system.

Thus, the system of claim 1 modifies the brake pressure applied at a given wheel, while retaining a pressure at or below that requested by the driver. This feature allows a relatively low-

cost system to be implemented. For example, the system of claim 1 may avoid the necessity of an auxiliary pump or any pressure-generating system that would be required to increase pressure above the pressure requested by a driver. In other words, the pressure in the brake system is always at or below the pressure generated by or directly related to the pressure upon the brake pedal, and does not require any additional pumps that tap into the system. Thus, it is submitted that the claims now more clearly distinguish over the cited references.

Turning first to the Katayose reference, as disclosed at column 4, lines 57-62 (and shown in Fig. 3 of that reference), the system of that reference includes a pair of fluid-pressure controlled pumps 13A, 13B which serve to generate pressure in the brake system. In addition, at column 7, lines 47-60, the Katayose reference discloses that pump 13A can be operated to increase fluid in the brake system above that requested by the driver and/or produced in the master cylinder 8.

Similarly, the Yoshioka reference includes a pair of hydraulic pumps 31a, 31b shown in Fig. 2 and discussed at column 4, lines 28-42. At column 4, lines 36-42, the Yoshioka reference discloses that hydraulic pressure can be developed by the hydraulic pumps 31a, 31b to be applied to the brake units independently of the pressure applied by the brake pedal 14. The Yoshioka reference does not appear to disclose that the pressure is always maintained at or below that requested by the driver.

The Poggenburg reference similarly discloses control of a vehicle utilizing an ABS control unit. Of course, an ABS control unit often includes a pump which adds increased pressure to the brake system. In addition, at column 4, lines 6-11 of the Poggenburg reference, it is disclosed that in an oversteering condition the ABS control unit increases the braking pressure on the outside front wheel by a predetermined amount, and does not disclose that the pressure is always maintained at or below that requested by the driver.

Further, the Poggenburg reference only appears to disclose braking of the front wheels (see, e.g., column 2, line 16; column 4, line 8; column 4, lines 39-40; column 4, lines 46-47; and column 4, lines 57-58). In contrast, each of the independent claims specifies that the controller is configured to direct the brake system to independently increase, decrease, or hold the brake pressure applied to each of said four wheels.

The Japanese '515 patent appears to be implemented in a vehicle utilizing ABS (see Figs. 5, 7, 15, 37, 39 and 40). Of course, as noted above, an ABS system often utilizes a pump or pumps to generate pressure above and beyond that generated in the master cylinder by a driver. The Japanese '515 patent does not appear to disclose that the pressure is always maintained at or below that requested by the driver. In addition, the Japanese '515 patent does not appear to disclose independent adjustment applied to each of the wheels of the vehicle.

The Batistic reference discloses a control system in which the brake pressure is increased or decreased by a "predetermined value." In contrast, claim 1 specifies that the change in brake pressure is based at least in part upon the slip status of each respective wheel. In addition, the Batistic reference does not appear to disclose a system configured such that the brake pressure applied to a wheel is always equal to or less than the brake pressure sought to be applied.

The Ogino reference discloses actuators 6RR, 6RL, 6FR and 6FL which can apply a braking force. The Ogino reference does not appear to disclose that the pressure is always maintained at or below that requested by the driver. In addition, the Ogino reference discloses adjusting the pressure in the actuators 6FL, 6FR, 6RL and 6RR based upon various real speed signals (column 9, lines 21-26). The Ogino reference does not appear to disclose individual braking controls based at least in part upon slip status of each respective wheel or based upon a corrective differential velocity.

Finally, as noted at column 10, lines 41-49, the Ogino reference suggests that the braking control adjustments are identical for both of the rear actuators, 6RR and 6RL. In contrast, claim 1 specifies that the system can independently increase, decrease, or hold the brake pressure applied to each of the four wheels.

The Giers reference merely discloses a method for determining the turning or cornering of a vehicle, and does not disclose a system for controlling a brake system of the vehicle which can direct a brake system to independently increase, decrease or hold the brake pressure applied to each of the four wheels based at least in part upon the slip status of each wheel or based upon a correctional differential velocity.

The Eckert reference is directed to a system for implementing ABS, traction slip control and brake proportioning. However, the system of the Eckert reference does not disclose a controller configured to direct a brake system to independently increase, decrease, or hold the

brake pressure applied to each of the four wheels based upon in part of the slip status (or correctional differential velocity) of each respective wheel. In addition, the Eckert reference does not disclose a system configured such that the brake pressure applied to a wheel is always equal to or less than the brake pressure sought to be applied.

The Klatt reference does not disclose a control system for controlling a brake system of a vehicle during a turn. Instead, the Klatt reference is directed to antilock control during wheel skidding. In addition, the Klatt reference does not disclose a system configured such that the system modifies the brake pressure applied to the wheel such that the brake pressure applied to that wheel is always equal to or less than the brake pressure sought to be applied.

Thus, it is submitted that claim 1 defines over each of the references cited in the Office action. In addition, as noted above, each of the remaining independent claims (claims 21, 30 and 31) include limitations similar to those of claim 1 as discussed above. Accordingly, it is submitted that the application is in a condition for allowance, and formal notice thereof is respectfully solicited.

New claim 32 depends from claim 1 and specifies that the system includes a master cylinder and that the system is configured such that a brake pressure applied to the wheel cannot be modified such that the brake pressure at that wheel is higher than the predetermined brake pressure in the master cylinder. New claim 33 depends from claim 1 and specifies that the brake pressure is directly related to a driver input via a brake pedal. New claims 35-38 depend from various ones of claims 21, 30 and 31, and include limitations similar to those of claims 32 and 33. New claim 34 depends from claim 21 and includes limitations similar to those of originally-filed claim 14.

An Information Disclosure Statement and the appropriate fee accompany this Amendment, and it is requested that the art cited therein be considered.

The applicant(s) hereby authorizes the Commissioner under 37 C.F.R. §1.136(a)(3) to treat any paper that is filed in this application which requires an extension of time as incorporating a request for such an extension.

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Amendment

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'S. Elleman', is written over a horizontal line.

Steven J. Elleman
Reg. No. 41,733

THOMPSON HINE LLP
2000 Courthouse Plaza NE
P. O. Box 8801
Dayton, Ohio 45401-8801
Telephone: (937) 443-6838
Facsimile: (937) 443-6635